

WHAT IS CLAIMED IS:

1. A method for integrating object changes occurring to an object in a first object storage system with a second object storage system, the method comprising steps of:

receiving from the first object storage system notification of an event relating to an object in the first object storage system;

setting up a representation of the object in the second object storage system in response to the notification;

determining object changes made to the object in the first object storage system using the representation in the second object storage system; and

integrating the determined object changes with the representation in the second storage system.

2. A method for integrating object changes as in claim 1, wherein the receiving step comprises the step of receiving a method call associated with the event from the first object storage system.

3. A method for integrating object changes as in claim 1, wherein the setting up step comprises the step of searching for a main copy of the object in the second object storage system.

4. A method for integrating object changes as in claim 3, wherein the setting up step further comprises the step of loading a main copy of the object from a database into the second object storage system.

5. A method for integrating object changes as in claim 4, wherein the integrating step further comprises the step of merging the object changes into the main copy of the object contained in the second object storage system.

6. A method for integrating object changes as in claim 1, wherein the setting up step includes creating a working copy for tracking the object

changes and an original state copy for maintaining the original state of the object;
and

the determining step comprises the steps of:

modifying the working copy according to the object changes in the first
object storage system; and

comparing the working copy of the object and the original state copy of
the object to determine the differences between the two copies.

7. A method for integrating object changes as in claim 6, wherein the determining
step further comprises the step of storing the object changes in a change storage
copy of the object in the second object storage system.

8. A method for integrating object changes as in claim 1, wherein the determining
step further comprises the step of modifying the representation in the second object
storage system with the object changes in the first object storage system.

9. A method for integrating object changes as in claim 1, wherein the integrating
step comprises the step of committing the object changes to a database.

10. A method for integrating object changes as in claim 1 further comprising the step
of registering an event listener with the first object storage system to obtain
notification of events relating to an object in the first object storage system.

11. A method for integrating object changes as in claim 1 further comprising steps of:
receiving a notification to undo actions in a transaction prior to the notification,
the notification being received up until after changes are updated to a database; and
undoing the actions.

12. A method for integrating entity bean object changes occurring to an entity bean
object in a container with a persistence manager, the container being capable of
issuing notifications of events relating to entity bean objects contained therein, the
method comprising steps of:

receiving from the container notification of an event relating to an entity bean object in the container;

setting up a copy of the entity bean object in the persistence manager in response to the container notification;

determining object changes made to the entity bean object in the container using the representation in the persistence manager; and

integrating the determined entity bean object changes with the copy in the persistence manager.

13. A method for integrating entity bean object changes as in claim 12, wherein the container is an Enterprise JavaBeans (EJB) container.

14. A method for integrating entity bean object changes as in claim 12, wherein the receiving step comprises the step of receiving a callback method associated with the event from the container.

15. A method for integrating entity bean object changes as in claim 12, wherein the setting up step comprises the step of searching for a main copy of the entity bean object in the persistence manager.

16. A method for integrating entity bean object changes as in claim 15, wherein the setting up step further comprises loading a main copy of the object from a database into the persistence manager.

17. A method for integrating entity bean object changes as in claim 16, wherein the integrating step further comprises the step of merging the entity bean object changes into a main copy of the entity bean object in the persistence manager.

18. A method for integrating entity bean object changes as in claim 12, wherein the setting up step includes creating a working copy for tracking changes to the entity bean object and an original state copy for maintaining the original state of the entity bean object; and

the determining step comprises the steps of:

modifying the working copy according to the entity bean object changes in the container; and

comparing the working copy of the entity bean object and the original state copy of the entity bean object to determine the differences between the two copies.

19. A method for integrating entity bean object changes as in claim 18, wherein the determining step further comprises the step of storing the entity bean object changes in a change storage copy of the object in the persistence manager.

20. A method for integrating entity bean object changes as in claim 19, wherein the integrating step comprises the step of committing the entity bean object changes to a database.

21. A method for integrating entity bean object changes as in claim 12, wherein the receiving step further comprises the step of registering a synchronization event listener with a transaction service of the container.

22. A method for integrating entity bean object changes as in claim 12 further comprising steps of:

receiving a rollback notification to undo actions in a transaction prior to the notification, the rollback notification being received up until after changes are updated to a database; and

undoing the actions.

23. An object change integration system for integrating object changes occurring to an object in a first object storage system with a second object storage system, the object change integration system comprising:

a notification receiver for receiving from the first object system notification of an event relating an object in the first object storage system;

a representation setter for setting up a representation of the object in the

second object storage system in response to the notification;

a change determination unit for determining object changes made to the object in the first object storage system using the representation in the second object storage system; and

an integrator for integrating the determined object changes with the representation in the second storage system.

24. An object change integration system as in claim 23, wherein the representation setter has a search facility for searching for a main copy of the object in the second object storage system.

25. An object change integration system as in claim 24, wherein the representation setter has a load facility for loading a main copy of the object from a database into the second object storage system.

26. An object change integration system as in claim 25, wherein the integrator has a merge facility for merging the object changes into the main copy of the object contained in the second object storage system.

27. An object change integration system as in claim 23, wherein

the representation setter has a copy creation facility for creating a working copy for tracking the object changes and an original state copy for maintaining the original state of the object; and

the change determination unit has:

an object modification facility for modifying the working copy according to the object changes in the first object storage system; and

an object comparison facility for comparing the working copy of the object and the original state copy of the object to determine the differences between the two copies.

28. An object change integration system as in claim 27, wherein the change determination unit has a change storage facility for storing the object changes in a

change storage copy of the object in the second object storage system.

29. An object change integration system as in claim 23, wherein the integrator has a commit facility for committing the object changes to a database.

30. An object change integration system as in claim 23 further comprising:

- a rollback notification unit for receiving notification to undo actions in a transaction prior to the notification, the notification being received up until after changes are updated to a database; and

- a rollback provider for undoing the actions.

31. An object change integration system for integrating entity bean object changes occurring to an entity bean object in a container with a persistence manager, the object change integration system comprising:

- a notification receiver for receiving from the container notification of an event relating to an entity bean object in the container;

- a representation setter for setting up a copy of the entity bean object in the persistence manager in response to the notification;

- a change determination unit for determining object changes made to the entity bean object in the container using the representation in the persistence manager; and

- an integrator for integrating the determined entity bean changes with the copy in the persistence manager.

32. An entity bean object change integration system as in claim 31, wherein the container is an Enterprise JavaBeans (EJB) container.

33. A persistence manager connector for integrating object changes occurring to an object in a first object storage system with a second object storage system, the persistence manager connector comprising:

- a notification receiver for receiving from the first object system notification of an event relating to an object in the first object storage system;

a representation setting instructor for instructing the second object storage system to set up a representation of the object in response to the notification;

a change determination instructor for instructing the second object storage system to determine object changes made to the object in the first object storage system using the representation in the second object storage system; and

an integration instructor for instructing the second storage unit to integrate the determined object changes with the representation in the second storage system.

34. A persistence manager connector as in claim 33, wherein the representation setter instructor has a search facility for searching for a main copy of the object in the second object storage system.

35. A persistence manager connector as in claim 34, wherein the representation setter instructor has a load instructor for instructing the second object storage system to load a main copy of the object from a database into the second object storage system.

36. A persistence manager connector as in claim 35, wherein the integrator instructor has a merge instructor for instructing the second object storage facility to merge the object changes into the main copy of the object contained in the second object storage system.

37. A persistence manager connector as in claim 33, wherein
the representation setter instructor has a copy creation instructor for instructing the second object storage facility to create a working copy for tracking the object changes and an original state copy for maintaining the original state of the object; and

the change determination instructor has:

an object modification instructor for modifying the working copy according to the object changes in the first object storage system; and

an object comparison instructor for instructing the second object storage facility to compare the working copy of the object and the original

state copy of the object to determine the differences between the two copies.

38. A persistence manager connector as in claim 37, wherein the change determination instructor has a change storage instructor for instructing the second object storage facility to store the object changes in change storage copy of the object in the second object storage system.

39. A persistence manager connector as in claim 33, wherein the integrator instructor has a commit instructor for instructing the second object storage facility to commit the object changes to a database.

40. A persistence manager connector as in claim 33 further comprising:

- a rollback notification unit for receiving notification to undo actions in a transaction prior to the notification, the notification being received up until after changes are updated to a database; and

- a rollback instructor for instructing the second object storage system to undo the actions.

41. A persistence manager connector for integrating entity bean object changes occurring to an entity bean object in a container with a persistence manager, the persistence manager comprising:

- a notification receiver for receiving from the container notification of an event relating to an entity bean object in the container;

- a representation setting instructor for instructing the second object storage system to set up a copy of the entity bean object in the persistence manager in response to the notification;

- a change determination instructor for instructing the second object storage system to determine object changes made to the entity bean object in the container using the representation in the persistence manager; and

- an integration instructor for instructing the second object storage system to integrate the determined entity bean changes with the copy in the persistence manager.

42. A persistence manager connector as in claim 41, wherein the first object storage system is an Enterprise JavaBeans (EJB) container.

43. Computer-readable media for storing instructions or statements for use in the execution in a computer of a method for integrating changes to an object in a first object storage system with a second object storage system, the method comprising the steps of:

receiving from the first object storage system notification of an event relating to an object in the first object storage system;

setting up a representation of the object in the second object storage system in response to the notification;

determining the changes made to the object in the first object storage system using the representation in the second object storage system; and
integrating the determined changes with the representation in the second storage system.

44. A computer program product for use in the execution in a computer for integrating changes to an object in a first object storage system with a second object storage system, the method comprising the steps of:

receiving from the first object storage system notification of an event relating to an object in the first object storage system;

setting up a representation of the object in the second object storage system in response to the notification;

determining the changes made to the object in the first object storage system using the representation in the second object storage system; and

integrating the determined changes with the representation in the second storage system.

45. A computer data signal embodied in a carrier wave and representing sequences of instructions which, when executed by a processor, cause the processor to integrate changes to an object in a first object storage system with a second object

storage system, the method comprising the steps of:

- receiving from the first object storage system notification of an event relating to an object in the first object storage system;

- setting up a representation of the object in the second object storage system in response to the notification;

- determining the changes made to the object in the first object storage system using the representation in the second object storage system; and
- integrating the determined changes with the representation in the second storage system.